



**PARIS SCHOOL OF ECONOMICS**  
ÉCOLE D'ÉCONOMIE DE PARIS

**WORKING PAPER N° 2010 - 04**

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and labor relations**

**Hélène Blake**

**Marc Sangnier**

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**PARIS-JOURDAN SCIENCES ÉCONOMIQUES**

48, Bd JOURDAN – E.N.S. – 75014 PARIS  
TÉL. : 33(0) 1 43 13 63 00 – FAX : 33 (0) 1 43 13 63 10  
[www.pse.ens.fr](http://www.pse.ens.fr)

# Senior activity rate, retirement incentives and labor relations\*

Hélène Blake<sup>†</sup> and Marc Sangnier<sup>‡</sup>

January 2010

## Abstract

How is it that populations react so differently to policy incentives among developed countries? We noticed that senior employment rates not only differ in level strikingly from one country to another, they also differ in their reaction to retirement incentives set by governments.

We show the importance of trust given to the employer in wage negotiations by a simple trade-off model. According to this model, reaction of the senior activity rate to policy changes depends on the properties of the distribution of trust to employers at the country level. We then identify these properties by an empirical study based on panel data for nineteen OECD countries from 1980 to 2004. We show that the elasticity of senior males labor force participation rate to retirement incentives is stronger in countries with better and more homogeneously distributed working conditions. This results also applies to countries with higher generalized trust.

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\*We thank Yann Algan, David Blau, Pierre Cahuc, Andrew Clark, Mathieu Couttenier, Lucie Gadenne and all seminar participants at the Paris School of Economics for their comments and Romain Duval for giving us access to implicit taxes data.

<sup>†</sup>Paris School of Economics - blake@pse.ens.fr

<sup>‡</sup>Paris School of Economics - sangnier@pse.ens.fr

# 1 Introduction and background

## Motivation

The issue of the efficiency of economic reforms is a central one in public policy agenda. Once a reform has been shown desirable by economic theory or empirical test, it not always produce desired effects when implemented. Labor force participation of older individuals is motivated both by the general issue of labor force participation in order to produce wealth and by the sustainability of pension systems. Most of the developed countries have been constantly adjusting pension systems during the last decades to reach these objectives. This is why one of the main point of the Lisbon strategy to develop Europe was the fostering of senior employment in order to “make Europe, by 2010, the most competitive and the most dynamic knowledge-based economy in the world”. The weak values of this economic indicator in some European countries was considered a restrain for growth and in the same period.

The policies lead to increase senior employment rate can be the postponing of the standard retirement age or the decreasing of retirement incentives. The later instrument includes pension and contribution rates changes. However, the effect of these policies is far from homogeneous in all countries : while in some countries population respond automatically to incentives, in other countries, no policy seems to affect senior employment, or very lightly.

If we consider the instance of Finland and Italy, we easily notice those striking differences. In figure 1, illustrating the case of Finland, we notice a perfect symmetric movement of incentives to retirement at 55 and the senior activity rate. The standard retirement age in Finland did not change a bit in this period, remaining at 65. On the contrary, if we look at figure 2, when the Italian government strongly decreased the incentive to retirement in the second half of the 1990s, the senior employment rate continued its decreasing trend. It is even more striking if we consider that this decrease in monetary incentive went alongside an increase of the standard retirement age from 60 in 1993 to 65 in 2002.

In this paper, we show how the quality of labor relations in a country is likely to alter the response senior activity rate to changes in retirement incentives. We present a model where senior workers have the choice between working and retirement. Their choice is affected by their perception of labor relations and generosity of the pension system. At the aggregate level, the response of



Figure 1 : Senior activity rate and implicit tax on continued work, including early retirement incentives, for Finland.

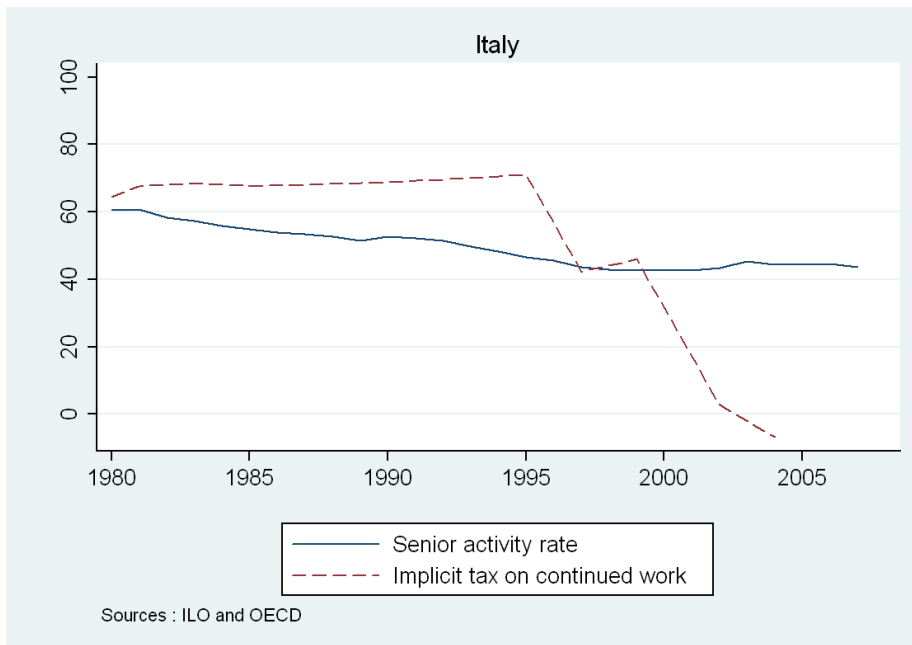


Figure 2 : Senior activity rate and implicit tax on continued work, including early retirement incentives, for Italy.

senior labor force participation rate to change in retirement incentives depends in the distribution of trust to employers in the society. We show that trust to employers, approximated by labor relations, non-monetary rewards employees may get from their work and trust in others, foster the elasticity of senior male participation rate with respect to the implicit tax on continued work, which is the cost of staying at work compared with retiring.

### **Literature background**

Our paper is related to several axis of literature. The first one is on policy efficiency in different backgrounds. Our first inspiration was linked to the article by Acemoglu et al. (2008) which points out the importance of constraints on politics in a central bank reform aiming at fighting inflation.

Institutional determinants of retirement inspired a large literature which makes our second axis. Duval (2003), whose measures we used in the empirical section, studied the importance of monetary incentives given by the social system in the determination of senior employment rates. He showed that a decrease of the incentive to retirement may reduce the fall of employment between two five-years age groups (for instance from 60 to 64 or 55 to 59). In a dynamic approach, Blau and Goodstein (2009) investigate to what extent changes in social security rules explain changes in labor force participation of seniors in the United States. Blau and Shvydko (2007) focused on the characteristics of firms and contracts. By an empirical study, they showed that seniors' choice of retirement also depends on the rigidities of technologies. According to Cheron et al. (2004), trying to increase senior employment by a change of pension scheme is useless if wages are rigid and above their walrasian level. Their point out the importance of firms' decisions in the senior employment rate. If their are the only decision makers (which is the case when wages are rigid and above the walrasian level), employment will not respond to incentives given to employees.

The third axis of literature linked to our subject treats the importance of labor relations. Such idea on the influence of labor relations on macroeconomic outputs was studied in a very practical approach by Blanchard and Phillipon (2004). Considering the number of social conflicts as a proxy for bad labor relations, they showed that bad relations strengthen the negative effect of asymmetric information on the job market. We use a more subjective proxy to estimate labor relations but the form of asymmetric information we use is similar : only the firm knows the real value of the output of a match and the worker estimates

her probability for the employer to be dishonest.

Understanding labor relations as a component of a country's cultural trait, this paper is also linked to the literature on economic outcomes of culture. Interactions between labor markets outcomes and culture has been investigated by Aghion, Algan and Cahuc (2008). They show that policy can affect cooperation on the labor market depending on individual expectations regarding collective relations organization. The way culture and beliefs can affect activity rates has been underlined by Giavazzi, Schiantarelli and Seranelli (2009). They show that culture matters for women employment rate.

The structure of the paper is as follows. In section 2 we present the model and derive its implications. In section 3, we describe the data used in the empirical part. Section 4 presents macroeconomic empirical results and section 5 concludes.

## 2 The model

Senior individuals face a trade-off between work and retirement. This model shows how their choice depends on labor relations and how the distribution of working conditions alter the link between retirement incentives and labor force participation rate at the macroeconomic level.

### Individual trade-off

Before they have a full right to a public pension system, seniors can chose early retirement. We follow Blanchard and Philippon's hypothesis of asymmetric information : in the wage negotiation, workers do not know their productivity but employers do. Employers can give the wrong information in order to pay a lower wage. Thus, if the worker chooses between work and early retirement, she has to take into account the probability for employers to be dishonest.

Let  $h_i$  be the subjective individual probability for the worker  $i$  to have an honest employer. There are two types of productivity and their corresponding wages. If the productivity is good, then the wage should be set at  $w_g$ , if productivity is bad, then it is set at level  $w_b$ . Of course,  $w_g$  is superior to  $w_b$ . Let us have  $\rho$  the proportion of good workers. This proportion is known by the worker but she does not know her own status. Thus the actualized value of early retirement is :

$$V^R = \alpha p + l + \beta (\alpha p + l)$$

where  $p$  is a full pension. It is truncated in proportion  $\alpha$  for the entire life if the individual retires early, that is before the usual age. Parameter  $\beta$  is the discount rate and  $l$  is the value of leisure.

The actualized value of working is then :

$$V^W = h_i[\rho w_g + (1 - \rho)w_b] + (1 - h_i)w_b + \beta(p + l).$$

Then, the worker will chose early retirement if and only if :

$$V^R \geq V^W$$

$$\iff (\alpha p + l)(1 + \beta) \geq h_i[\rho w_g + (1 - \rho)w_b] + (1 - h_i)w_b + \beta(p + l)$$

that is if:

$$h_i \leq \frac{(\alpha p + l)(1 + \beta) - [w_b + \beta(p + l)]}{\rho(w_g - w_b)}$$

### Aggregate results

If in a given country  $c$ , trust to employer follows the cumulative distributive function  $F_c$ , then the proportion of seniors choosing early retirement  $n_R^c$  given a policy incentive  $\alpha$  will be :

$$n_R^c(\alpha) = F_c \left( \frac{(\alpha p + l)(1 + \beta) - [w_b + \beta(p + l)]}{\rho(w_g - w_b)} \right)$$

Let  $n^c$  be the labor force participation of seniors in country  $c$ . Since  $n = 1 - n_R$ , we get :

$$n^c = 1 - F_c \left( \frac{(\alpha p + l)(1 + \beta) - [w_b + \beta(p + l)]}{\rho(w_g - w_b)} \right)$$

See appendix for threshold values of  $\alpha$  for which either nobody or everyone choose to retire. Given the main properties of a cumulative distributive function, since  $h_i \in [0, 1]$ , we have the following properties :

1. For a given policy  $(\alpha, p)$ , the resulting labor force participation rate in country  $c$  depends on the distribution of labor relations  $F_c$ .
2. The derivative of  $n^c$  with respect to  $\alpha$  is

$$\frac{\partial n^c}{\partial \alpha} = - \frac{\partial F_c(\cdot)}{\partial \alpha} \frac{\alpha p}{\rho(w_g - w_b)}.$$

Since  $\partial F_c / \partial \alpha \geq 0$ , we get  $\partial n^c / \partial \alpha \leq 0$ . This implies that the stronger the

incentive to retire early, the stronger the proportion of seniors who stop working. Individuals respond to incentives unless the density of variable  $h_i$  is null. But the size of the effect of  $\alpha$  on  $n^c$  depends on the characteristics of the distribution function  $F_c$ .

As a result, the effectiveness of early retirement incentives depends on the properties of the distribution of trust to employers.

### 3 Data

This section describes data used in this paper. We used data from several sources. Our sample includes 19 countries : Australia, Belgium, Canada, Finland, France, Germany, Ireland, Italy, Japan South Korea, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States. We focus on seniors male individuals in order to avoid all issues related to female employment.

#### Senior activity rates

Senior activity rates are taken from the Key Indicators of the Labor Market provided by the International Labor Organization. Data are available for males and females by age group from 1980 onwards. We selected data for males aged between 55 and 64. Senior activity rates do differ in space, but also exhibit different evolutions in time.

#### Pension system

Pension system generosity is measured using the implicit tax on continued work developed by Duval (2003). The average implicit tax on continued work is computed at a given age for a five year period. It takes into account expected pension wealth and both employers and employees rates of contribution to the pension system. In other terms, when the implicit tax on continued work increases, a worker has weaker incentives to continue working. For a detailed presentation of the methodology, see Duval (2003). In this paper, we use the measures for the 55-60 and the 60-64 age groups as alternative indicators of the whole pension system generosity. For each age group, the implicit tax is available with or without early retirement schemes. However, implicit tax including early retirement route is by construction less trustworthy since information about early

retirement eligibility are hard to assemble. This is why we focused on the indicators without early retirement schemes and estimations involving implicit tax on continued work including early retirement route are presented in appendix.

### **Working conditions**

We use ISSP surveys about work orientations to measure work relations. This survey has been conducted in 1989, 1997 and 2005 in 30 countries. Among the broad set of questions asked to workers, we selected four questions that reflect two aspect of working conditions. Two of them are explicitly and directly related to relations at the workplace, namely :

- *rel management* : “In general, how would you describe relations at your workplace between management and employees ?”
- *rel workmates* : In general, how would you describe relations at your workplace between work- mates/colleagues ?

Answers to those questions are coded from 1 (very bad) to 5 (very good).

The two other questions are related to he non-monetary payoff workers may get from their work :

- *job justformoney* : “How much you agree or disagree with each statement, thinking of work in general : A job is just a way of earning money - no more.”
- *job evenwithoutmoney* : “How much you agree or disagree with each statement, thinking of work in general : I would enjoy having a paid job even if I did not need the money.”

Answers to those questions are coded from 1 (strongly agree) to 5 (strongly disagree). Hence, we recoded *job evenwithoutmoney* in the opposite way to get a measure that reflects improving working conditions.

For each of these question, we construct two basic indicators that may reflect some aspects of the distribution of working conditions at the country level. The simplest indicator is the average answer. The other one is the coefficient of variation, i.e. the ratio of standard deviation to mean for each variable. This is a broad measure for the dispersion of the variable.

Unfortunately, these questions are only asked to workers and since we are interested in working conditions perceived by all seniors, including those who

are retired, the computed indicator may be biased if only seniors are selected. Hence, we used male workers aged between 35 and 54 to assess the perception of working conditions at the country level.

In panel data estimations, we assign working conditions for missing years using the following simple method : for years 1980-1989, we use the 1989 working conditions measure if available, for years 1990-1996 the 1997 measure and for years 1998 onwards the 2005 measure. If a country has been surveyed only once or twice, we replicate this method, but using only available measures.

### **Control variables**

Panel data regressions include wealth and economic activity indicators as control variables. Wealth is measured using the (log of) real GDP per capita provided by the Penn World Table. We take the OECD male unemployment rate as a proxy for economic activity at the country level. We also use the standard retirement age provided by Duval (2003).

## **4 Empirical results**

This section presents empirical evidence. We first show that working conditions explain some of cross country differences in senior activity rates. Then, we use panel data estimates to show that senior activity rates do react stronger to changes in incentives in countries with better working conditions. Since senior activity rates and implicit taxes are always taken in log, estimated coefficients reflect elasticities of labor market participation to retirement incentives.

### **Cross country evidence**

We pooled all available observations in order to investigate the cross-country relationship between working conditions and senior activity rates. Table 1 presents the estimated coefficients for different specifications. In column 1, we simply regress senior males activity rate on average relation between management and employees. The estimated coefficient is positive and significant at the 5% level. In column 2, we include a dummy variable for European countries to be sure that this relationship is not driven only by the opposition between Europe and the rest of the world. The estimated coefficient on *rel management* increases and becomes significant at the 1% level. The dummy variable for European

countries is negative and significant. This implies that senior labor force participation rates are weaker in Europe than in the rest of the world. In column 3, we control by the implicit tax on continued work for age group 55-59 : this variable is not significant whereas relation between management and employees remains significant at the 5% level and has the same order of magnitude as in former specifications. In column 4, we add real GDP per capita and standard retirement age as additional control variable, which lowers the significance of the coefficient on *rel management*, though not too far from 10%.

In columns 5 to 16 we repeat the same exercise with the three others measures of working conditions. The effect of *rel workmates* and *job evenwithoutmoney* variables is robust to the introduction of standard retirement age. However, we find no significant effect of variable *job justformoney* on senior activity rate.

As shown in tables 1.1, 1.2 and 1.3 in appendix, using other measures of retirement incentives (for age group 60-64 or including early retirement incentives) as control variables gives very similar results. When significant, the coefficient of the implicit tax variable is negative. This result is consistent with our prediction that controlling for working conditions, generosity of the pension system has a negative impact on senior activity rate.

Figures 3 and 4 shows the positive relationship between labor force participation rate of seniors and the variables *rel management* and *job evenwithoutmoney* in 2005. In line with estimations made here, working conditions explain a substantial part of differences in senior activity rate across countries. Figures 5 and 6 in appendix describe the same relationship for *rel workmates* and *job justformoney*. Consistently with pooled regressions results, there is no significant effect of the later on activity rate.

Hence, in a cross section of countries, better working conditions are associated with stronger labor fore participation rate of senior males.

## Panel data evidence

We first estimate the average effect of the implicit taxes on senior activity rate. Table 2 displays estimated coefficients. It is clear that wealth, measured as the real GDP per capita, and economic activity, measured as male unemployment rate, both have a negative effect on labor force participation rate of seniors. The effect of wealth on the dependent variable suggests that non-participation to the labor market increases as the economy grows. However, when including time fixed effect in order to control for the evolution of senior activity rate

		Table I.1 - Pooled cross section							
Dependent variable : Labor market participation rate of males aged between 55 and 64		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Implicit tax variable : Implicit tax on continued work for age group 55-59									
rel management		0.391** (0.0234)	0.458*** (0.00160)	0.435** (0.0374)	0.349 (0.118)	0.397* (0.0639)	0.639*** (0.000706)	0.712*** (0.00266)	0.637*** (0.00928)
rel workmates							-0.243*** (0.000212)	-0.319*** (0.000648)	-0.322*** (0.00109)
Europe			-0.187*** (0.00145)	-0.223** (0.0131)	-0.228** (0.0164)			0.0648* (0.0714)	0.0705* (0.0587)
Implicit tax				0.0407 (0.302)	0.0446 (0.273)				-0.0706 (0.455)
Real GDP per capita					-0.00192 (0.984)				0.0277 (0.455)
Standard retirement age					0.0385* (0.0689)				0.143 (0.143)
Constant		2.622*** (0.000214)	2.527*** (2.07e-05)	2.545*** (0.00309)	0.395 (0.790)	2.453*** (0.00773)	1.648** (0.0245)	1.249 (0.182)	0.470 (0.718)
Observations		38	38	35	35	38	38	35	35
R-squared		0.157	0.339	0.286	0.342	0.136	0.411	0.420	0.443
<hr/>									
job justformoney		0.150 (0.106)	0.140 (0.136)	0.101 (0.203)	0.112 (0.255)				
job evenwithoutmoney						0.505*** (1.96e-07)	0.476*** (6.45e-07)	0.448*** (3.24e-06)	0.458*** (1.12e-05)
Europe			-0.157** (0.0121)	-0.158** (0.0284)	-0.199** (0.0109)		-0.0514 (0.124)	-0.0260 (0.533)	-0.0148 (0.762)
Implicit tax				0.0132 (0.706)	0.0372 (0.275)			-0.0194 (0.353)	-0.0250 (0.270)
Real GDP per capita					-0.147 (0.162)				0.0556 (0.470)
Standard retirement age					0.0548** (0.0115)				-0.00591 (0.736)
Constant		3.604*** (0)	3.772*** (0)	3.870*** (0)	1.737 (0.203)	2.401*** (1.91e-10)	2.541*** (7.24e-11)	2.663*** (1.06e-10)	2.456*** (0.00725)
Observations		38	38	35	35	38	38	35	35
R-squared		0.081	0.212	0.190	0.292	0.590	0.602	0.578	0.581

OLS regressions with time fixed effects  
Included countries are those surveyed in ISSP 1989, 1997 or 2005  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

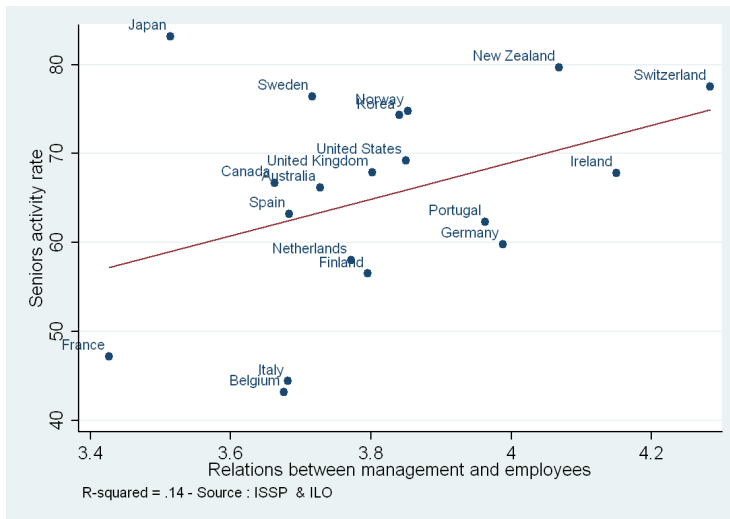


Figure 3 : Seniors activity rate and relations between mangement and employees in 2005.  
 ISSP Work Orientation 2005 for all countries except Austria (1989), Italy (1997) and Netherlands (1997). Labor force participation rate of males aged between 55 and 64.

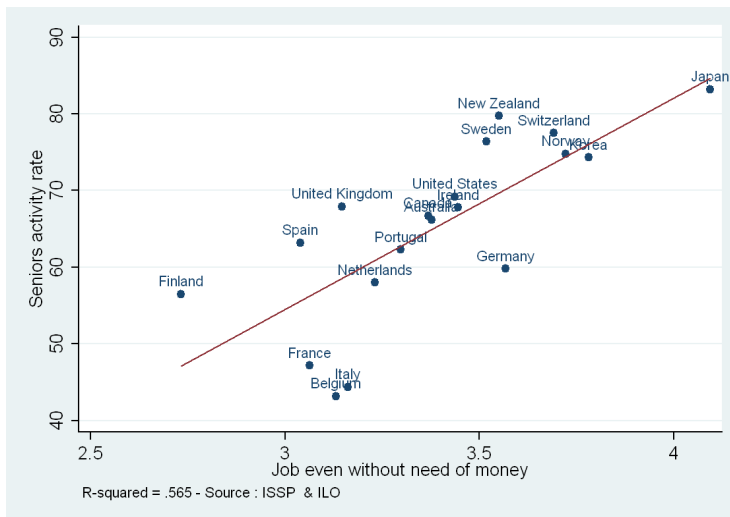


Figure 4 : Seniors activity rate and “I would enjoy having a paid job even if I did not need the money” in 2005.  
 ISSP Work Orientation 2005 for all countries except Austria (1989), Italy (1997) and Netherlands (1997). Labor force participation rate of males aged between 55 and 64.

common to all countries, the effect of real GDP per capita vanishes. This suggests that labor force participation rate of seniors depends more on broad global economic developments than on specific national wealth effects. We find no significant effect of standard retirement age. This means that changes in standard retirement age is not a major determinant of senior activity rate at the country level.

Neglecting the case of implicit tax on continued work for age group 55-59, the estimated elasticity of implicit tax variables is roughly equal to  $-0.03$  in most demanding specifications. The corresponding effect for implicit tax for age group 55-59 is null.

### **Interaction between implicit tax and average working conditions**

We now allow the effect of implicit tax on continued work to vary with the distribution of working conditions. Hence, the estimated equation is now :

$$n_{it} = \delta_1 T_{it} + \delta_2 W_i T_{it} + \delta_3 X_{it} + C_i + \delta_4 + \varepsilon_{it},$$

where  $n_{it}$  denotes labor force participation rate of senior males in country  $i$  at time  $t$ ,  $T_{it}$  the implicit tax on continued work,  $W_i$  working conditions and  $X_{it}$  a vector of control variables (wealth, unemployment and standard retirement age). The variable  $C_i$  is the country fixed effect,  $\delta$  the constant and  $e_{it}$  the error term. More complete specifications include year fixed effects  $Y_t$ . Thus, the estimated elasticity may now vary with working conditions :

$$\frac{\partial n_i}{\partial T_i} = \hat{\delta}_1 + \hat{\delta}_2 W_i.$$

Table 3 uses the implicit tax for age group 55-59. The measure of working conditions is the average value of each variable at the country level. In the case of *rel management* and *rel workmates*, the interaction term is always positive and strongly significant even when including time fixed effects and standard retirement age. This implies that countries with average better working conditions react stronger to changes in incentives than others. The two bottom line of the table present the values of elasticities for the countries with lower and higher working conditions. The previously null estimated effect ranges in fact from 0 to  $-0.04$  or  $-0.05$  depending on the working conditions variable used.

Estimations using the variable *job justformoney* produce weaker results. In the simplest specification (column 7), the interaction term is significant and

Table 2 - Panel data : Benchmark estimation						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
	(1)	(2)	(3)	(4)	(5)	(6)
	Implicit tax for age group 55-59			Implicit tax for age group 60-64		
Implicit tax	-0.0191 (0.239)	-0.0179 (0.353)	-0.0164 (0.388)	-0.0284** (0.0356)	-0.0315*** (0.00642)	-0.0380*** (0.00719)
Unemployment rate	-0.00957*** (0)	-0.00633*** (0.00826)	-0.00623*** (0.00814)	-0.0112*** (0)	-0.00661*** (0.000299)	-0.00714*** (0.00103)
Real GDP per capita	-0.153*** (5.77e-09)	-0.124 (0.126)	-0.116 (0.146)	-0.144*** (3.98e-07)	-0.0209 (0.727)	-0.0731 (0.282)
Standard retirement age			0.00235 (0.840)			-0.0115 (0.266)
Constant	5.787*** (0)	5.513*** (1.83e-10)	5.276*** (2.35e-05)	5.725*** (0)	4.528*** (0)	5.790*** (1.08e-08)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	288	288	288	300	300	289
R-squared (within)	0.192	0.450	0.450	0.229	0.496	0.507
Number of countries	18	18	18	19	19	19
	(7)	(8)	(9)	(10)	(11)	(12)
	Implicit tax for age group 55-59 including early retirement route			Implicit tax for age group 60-64 including early retirement route		
Implicit tax	-0.0432*** (0.00700)	-0.0285* (0.0604)	-0.0272* (0.0684)	-0.0349*** (0.00288)	-0.0298*** (0.00156)	-0.0322*** (0.00375)
Unemployment rate	-0.0116*** (0)	-0.00675*** (0.00292)	-0.00664*** (0.00243)	-0.0109*** (0)	-0.00603*** (0.000824)	-0.00662*** (0.00182)
Real GDP per capita	-0.189*** (0)	-0.0762 (0.242)	-0.0674 (0.268)	-0.145*** (2.42e-08)	-0.0124 (0.839)	-0.0564 (0.396)
Standard retirement age			0.00388 (0.746)			-0.00792 (0.422)
Constant	6.225*** (0)	5.067*** (0)	4.729*** (5.54e-06)	5.768*** (0)	4.457*** (0)	5.404*** (1.15e-08)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	306	306	306	317	317	306
R-squared (within)	0.296	0.498	0.500	0.264	0.493	0.499
Number of countries	19	19	19	19	19	19

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3 - Panel data : Interactions with average working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 55-59						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	0.253*** (0.000914)	0.229** (0.0160)	0.250** (0.0122)	0.288*** (0.000206)	0.215** (0.0233)	0.235** (0.0143)
Interaction	-0.0721*** (0.000181)	-0.0658*** (0.00390)	-0.0702*** (0.00296)	-0.0750*** (4.10e-05)	-0.0568*** (0.00673)	-0.0607*** (0.00396)
Unemployment rate	-0.00984*** (0)	-0.00682*** (0.00337)	-0.00659*** (0.00390)	-0.00942*** (0)	-0.00608** (0.0102)	-0.00581** (0.0121)
Real GDP per capita	-0.153*** (2.08e-09)	-0.133* (0.0717)	-0.111 (0.137)	-0.146*** (7.49e-09)	-0.110 (0.145)	-0.0882 (0.243)
Standard retirement age			0.00634 (0.560)			0.00591 (0.592)
Constant	5.790*** (0)	5.615*** (0)	4.981*** (3.15e-05)	5.718*** (0)	5.384*** (0)	4.779*** (7.46e-05)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	288	288	288	288	288	288
R-squared (within)	0.226	0.478	0.481	0.234	0.473	0.476
Number of countries	18	18	18	18	18	18
Min effect	0	0	0	0	-0.01	0
Max effect	-0,06	-0,05	-0,05	-0,05	-0,04	-0,04
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	0.0708* (0.0723)	-0.0561 (0.245)	-0.0539 (0.252)	0.00938 (0.897)	0.0822 (0.221)	0.0938 (0.187)
Interaction	-0.0275* (0.0328)	0.0116 (0.350)	0.0114 (0.354)	-0.00847 (0.642)	-0.0299* (0.0655)	-0.0324* (0.0571)
Unemployment rate	-0.00911*** (5.11e-10)	-0.00682*** (0.00895)	-0.00672*** (0.00863)	-0.00945*** (6.26e-11)	-0.00586** (0.0165)	-0.00561** (0.0208)
Real GDP per capita	-0.150*** (1.45e-08)	-0.141 (0.112)	-0.133 (0.126)	-0.155*** (1.53e-08)	-0.144* (0.0569)	-0.128 (0.100)
Standard retirement age			0.00222 (0.849)			0.00506 (0.655)
Constant	5.750*** (0)	5.683*** (1.47e-09)	5.456*** (2.52e-05)	5.798*** (0)	5.708*** (0)	5.213*** (3.07e-05)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	288	288	288	288	288	288
R-squared (within)	0.200	0.451	0.452	0.193	0.462	0.464
Number of countries	18	18	18	18	18	18
Min effect	0	-	-	-	-0.08	-0.09
Max effect	-0,04	-	-	-	-0,12	-0,13

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

negative. However, this effect does not persist in more when using time fixed effects. This result mirrors the one found in cross section regressions. When using *job evenwithoutmoney*, only the interaction term is significant. This leads to stronger estimated elasticities. In appendix, tables 3.1, 3.2 and 3.3 present the coefficients of the same regressions, but using different implicit taxes. The results are broadly similar to the later.

Consequently, labor participation rate of senior react stronger to changes in retirement incentives in countries with better average working conditions.

### **Interaction between implicit tax and the dispersion of working conditions**

We will now use the coefficient of variation of working conditions at the country level as an indicator of the distribution of the quality of labor relations. Table 4 uses the implicit tax on continued work for age group 60-64 as pension system generosity measure. For *rel management* and *rel workmates* variables, the interaction term between implicit tax and the coefficient of variation, an indicator of the dispersion of working conditions, is positive and significant in all specifications. The positivity of the coefficient suggest that countries with more a more homogeneous distribution of working conditions react stronger to changes in incentives than countries with higher dispersion of working conditions. In the two bottom lines of the table, the reading order is opposite to the one in former tables. The maximum (minimum) effect is the elasticity associated with the country with the higher (lower) dispersion of working conditions.

In the second part of table 4, we use the coefficient of variation of variables *job justformoney* and *job evenwithoutmoney* to assess the distribution of working conditions at the country level. Estimated interactions are all non-significant. Tables 4.1, 4.2 and 4.3 in appendix replicate the same exercise, but using alternative implicit taxes. Results are fully in line with those presented here.

Thus, labor participation rate of seniors react stronger to changes in retirement incentives in countries with more homogeneous working conditions. However, this results is restricted to *rel management* and *rel workmates* variables.

Table 4 - Panel data : Interactions with the dispersion of working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 60-64						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	-0.0517*** (0.00393)	-0.0629*** (4.88e-06)	-0.0625*** (0.000377)	-0.0692*** (0.000294)	-0.0680*** (7.20e-06)	-0.0677*** (8.01e-05)
Interaction	0.0982* (0.0754)	0.133** (0.0143)	0.109** (0.0362)	0.289*** (0.000170)	0.259*** (0.000741)	0.240*** (0.000621)
Unemployment rate	-0.0111*** (0)	-0.00566*** (0.00266)	-0.00627*** (0.00416)	-0.0101*** (1.80e-10)	-0.00501*** (0.00640)	-0.00515** (0.0160)
Real GDP per capita	-0.134*** (1.31e-06)	0.0217 (0.740)	-0.0274 (0.708)	-0.125*** (3.79e-06)	0.0155 (0.791)	-0.0150 (0.823)
Standard retirement age			-0.00732 (0.479)			-0.00607 (0.523)
Constant	5.630*** (0)	4.118*** (1.07e-09)	5.078*** (2.39e-06)	5.534*** (0)	4.173*** (0)	4.862*** (4.68e-07)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	300	300	289	300	300	289
R-squared (within)	0.239	0.513	0.516	0.273	0.530	0.534
Number of countries	19	19	19	19	19	19
Min effect	-0,04	-0,05	-0,05	-0,05	-0,05	-0,05
Max effect	-0,02	-0,02	-0,03	-0,01	-0,02	-0,02
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	-0.0340* (0.0789)	-0.0245 (0.103)	-0.0351* (0.0512)	-0.0263* (0.0722)	-0.0383*** (0.000653)	-0.0466*** (0.00274)
Interaction	0.0144 (0.683)	-0.0175 (0.574)	-0.00758 (0.832)	-0.00715 (0.795)	0.0231 (0.418)	0.0287 (0.321)
Unemployment rate	-0.0111*** (6.16e-10)	-0.00691*** (0.000475)	-0.00729*** (0.00274)	-0.0113*** (0)	-0.00635*** (0.000765)	-0.00679*** (0.00229)
Real GDP per capita	-0.145*** (2.49e-07)	-0.0235 (0.699)	-0.0748 (0.282)	-0.144*** (7.63e-07)	-0.0243 (0.686)	-0.0782 (0.257)
Standard retirement age			-0.0113 (0.278)			-0.0118 (0.246)
Constant	5.731*** (0)	4.560*** (0)	5.803*** (1.08e-08)	5.719*** (0)	4.554*** (0)	5.852*** (1.24e-08)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	300	300	289	300	300	289
R-squared (within)	0.230	0.497	0.507	0.229	0.498	0.510
Number of countries	19	19	19	19	19	19
Min effect	-	-	-	-	-	-
Max effect	-	-	-	-	-	-

OLS regressions with country fixed effects

Robust p values in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### **Interaction between implicit tax and generalized trust**

In table 5, we replace working conditions by trust of males aged between 55 and 64. Trust is measured at the country level using the European Values Survey and the World Values Survey. Trust is the share of people who answer “most people can be trusted” to the following question : “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people ?” This widely used measure of trust in others is recognized as a proxy for many aspects of cooperation and confidence incentives. Table 5 shows that trust in others play the same role as the quality of labor relations in the response of seniors participation rate to retirement incentives. The interaction term between trust and implicit tax is always negative and strongly significant. As previously, we find that the elasticity of senior activity rate to pension generosity is stronger in countries with higher trust. This result holds for all specifications (controlling for standard retirement age and including time fixed effects) and when using different measures of implicit tax on continued work. We do not measure the role of the dispersion of trust since it will not provide additional information in the case of a Bernoulli variable. All the information about the distribution function is summarized in the average answer.

Hence, labor force participation rate of seniors react stronger to changes in retirement incentives in countries with higher trust.

## **5 Conclusion**

In this paper, we tried to identify the causes of different reactions of the senior populations to monetary incentives between countries. By a very simple model we first showed that one of the main determinant of how seniors react to policies is the distribution of trust given to employers in wage bargaining. We then used panel data from OCDE and opinions about working conditions from ISSP in 19 countries to see more precisely in what conditions incentive policies are more efficient.

We found that if the average opinion about labor relations is good in a country, then senior employment will be more sensitive to changes in policy. We also found that concerning only questions specific to relations in the labor place reactions to policies are stronger when opinions are homogenous.

Finally, using the literature on social capital and as a prolongation of our work, we considered the role of trust in other people in the general way. It

Table 5 - Panel data : Interaction with trust						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
	(1)	(2)	(3)	(4)	(5)	(6)
	Implicit tax for age group 55-59			Implicit tax for age group 60-64		
Implicit tax	0.00449 (0.772)	0.000870 (0.966)	0.00193 (0.922)	-0.00389 (0.768)	-0.0146 (0.222)	-0.0170 (0.236)
Interaction with trust	-0.0608*** (0.00878)	-0.0470** (0.0143)	-0.0467** (0.0170)	-0.0547*** (0.00576)	-0.0373** (0.0113)	-0.0448*** (0.00307)
Unemployment rate	-0.0106*** (0)	-0.00668*** (0.00494)	-0.00660*** (0.00485)	-0.0126*** (0)	-0.00739*** (6.41e-05)	-0.00786*** (0.000252)
Real GDP per capita	-0.156*** (1.87e-09)	-0.111 (0.165)	-0.104 (0.181)	-0.155*** (1.67e-08)	-0.0174 (0.773)	-0.0670 (0.318)
Standard retirement age			0.00186 (0.873)			-0.0127 (0.207)
Constant	5.825*** (0)	5.389*** (2.39e-10)	5.202*** (2.12e-05)	5.837*** (0)	4.496*** (0)	5.812*** (4.69e-09)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	288	288	288	300	300	289
Number of countries	18	18	18	19	19	19
R-squared (within)	0.216	0.463	0.463	0.260	0.510	0.526
Min effect	-0,01	-0,01	-0,01	-0,01	-0,01	-0,01
Max effect	-0,05	-0,04	-0,03	-0,04	-0,03	-0,03
	(7)	(8)	(9)	(10)	(11)	(12)
	Implicit tax for age group 55-59 including early retirement route			Implicit tax for age group 60-64 including early retirement route		
Implicit tax	-0.0212 (0.231)	-0.00714 (0.667)	-0.00518 (0.749)	-0.0180 (0.144)	-0.0140 (0.171)	-0.0127 (0.297)
Interaction with trust	-0.0451*** (0.00256)	-0.0446*** (0.000651)	-0.0454*** (0.000505)	-0.0349** (0.0214)	-0.0333*** (0.00643)	-0.0383*** (0.00319)
Unemployment rate	-0.0129*** (0)	-0.00792*** (0.000335)	-0.00780*** (0.000270)	-0.0120*** (0)	-0.00686*** (0.000210)	-0.00731*** (0.000620)
Real GDP per capita	-0.196*** (0)	-0.0799 (0.214)	-0.0690 (0.254)	-0.151*** (2.62e-09)	-0.00713 (0.908)	-0.0463 (0.494)
Standard retirement age			0.00488 (0.675)			-0.00870 (0.366)
Constant	6.297*** (0)	5.104*** (0)	4.679*** (4.70e-06)	5.835*** (0)	4.407*** (0)	5.351*** (1.68e-08)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	306	306	306	317	317	306
Number of countries	19	19	19	19	19	19
R-squared (within)	0.321	0.521	0.523	0.281	0.508	0.518
Min effect	-0,01	-0,01	-0,01	0	0	-0,01
Max effect	-0,03	-0,03	-0,03	-0,03	-0,02	-0,03

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

appeared that this broader indicator has a similar explicative power than more precise questions specific to the labor market.

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## 6 Appendix

### Threshold values for early retirement

1. Everyone retires early if  $\alpha$  the incentive to early retirement is above a threshold  $\bar{\alpha}$  characterized by :

$$\bar{\alpha} = \frac{\rho w_g + (1 - \rho)w_b + \theta p - l}{p(1 + \theta)}$$

If the reward of early retirement is above the expected value without any uncertainty, then everyone retires early.

2. Nobody retires early if  $\alpha$  the incentive to early retirement is below a threshold  $\underline{\alpha}$  characterized by :

$$\underline{\alpha} = \frac{w_b + \theta(p + l) - l(1 + \theta)}{p(1 + \theta)}$$

If the worse income of the work is more rewarded than early retirement, then every senior prefers working.



Figure 5 : Seniors activity rate and relations between workmates in 2005. ISSP Work Orientation 2005 for all countries except Austria (1989), Italy (1997) and Netherlands (1997). Labor force participation rate of males aged between 55 and 64.

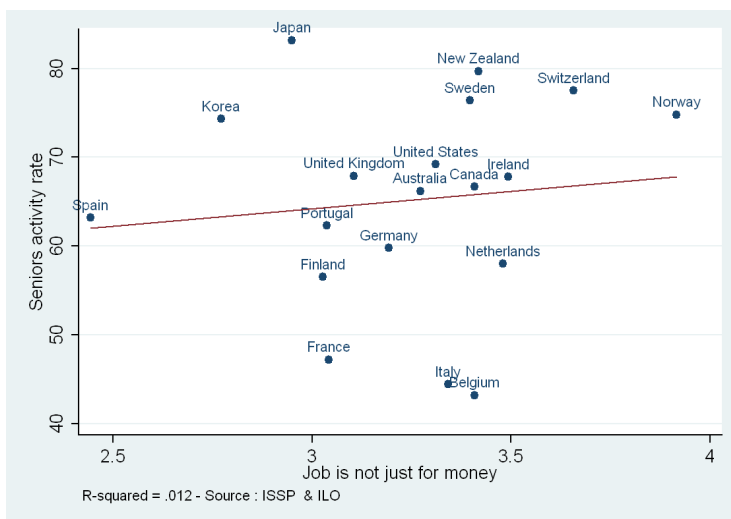


Figure 6 : Seniors activity rate and “Job is not just a way to earn money” in 2005. ISSP Work Orientation 2005 for all countries except Austria (1989), Italy (1997) and Netherlands (1997). Labor force participation rate of males aged between 55 and 64.

Table I.1 - Pooled cross section								
Dependent variable : Labor market participation rate of males aged between 55 and 64								
Implicit tax variable : Implicit tax on continued work for age group 60-64								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
rel managment	0.391** (0.0234)	0.458*** (0.00160)	0.327** (0.0285)	0.231 (0.257)	0.397* (0.0639)	0.639*** (0.000706)	0.481** (0.0160)	0.347 (0.129)
rel workmates						-0.243*** (0.000212)	-0.200** (0.0140)	-0.181** (0.0238)
Europe		-0.187*** (0.00145)	-0.147** (0.0439)	-0.139* (0.0504)			-0.0466 (0.228)	-0.0392 (0.335)
Implicit tax			-0.0646* (0.0746)	-0.0542 (0.150)				0.0298 (0.736)
Real GDP per capita				0.0769 (0.484)				0.0264 (0.736)
Standard retirement age				0.0250 (0.214)				0.0264 (0.122)
Constant	2.622*** (0.000214)	2.527*** (2.07e-05)	3.191*** (3.22e-06)	1.126 (0.379)	2.453*** (0.00773)	1.648** (0.0245)	2.416*** (0.00517)	0.925 (0.480)
Observations	38	38	37	37	38	38	37	37
R-squared	0.157	0.339	0.431	0.479	0.136	0.411	0.455	0.494
<hr/>								
job justformoney	0.150 (0.106)	0.140 (0.136)	0.0690 (0.477)	0.0117 (0.913)				
job evenwithoutmoney					0.505*** (1.96e-07)	0.476*** (6.45e-07)	0.444*** (2.56e-06)	0.442*** (5.60e-05)
Europe		-0.157** (0.0121)	-0.107 (0.147)	-0.117* (0.0890)		-0.0514 (0.124)	-0.00768 (0.825)	-0.00564 (0.877)
Implicit tax			-0.0916*** (0.00902)	-0.0655* (0.0842)			-0.0807*** (0.000439)	-0.0820*** (0.00155)
Real GDP per capita				0.0237 (0.822)				0.0452 (0.398)
Standard retirement age				0.0375** (0.0127)				-0.00116 (0.946)
Constant	3.604*** (0)	3.772*** (0)	4.251*** (0)	1.704 (0.157)	2.401*** (1.91e-10)	2.541*** (7.24e-11)	2.862*** (0)	2.491*** (0.00642)
Observations	38	38	37	37	38	38	37	37
R-squared	0.081	0.212	0.372	0.453	0.590	0.602	0.717	0.719

OLS regressions with time fixed effects  
Included countries are those surveyed in ISSP 1989, 1997 or 2005  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 1.2 - Pooled cross section								
Dependent variable : Labor market participation rate of males aged between 55 and 64								
Implicit tax variable : Implicit tax on continued work for age group 55-59, including early retirement route								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
rel managemment	0.391** (0.0234)	0.458*** (0.00160)	0.267* (0.0610)	0.0703 (0.719)				
rel workmates					0.397* (0.0639)	0.639*** (0.000706)	0.421** (0.0466)	0.124 (0.601)
Europe		-0.187*** (0.00145)	-0.0565 (0.631)	-0.0415 (0.685)		-0.243*** (0.000212)	-0.143 (0.304)	-0.0690 (0.620)
Implicit tax			-0.0619 (0.167)	-0.0580 (0.135)			-0.0381 (0.453)	-0.0505 (0.315)
Real GDP per capita				0.0253 (0.804)				0.0136 (0.862)
Standard retirement age				0.0405** (0.0325)				0.0399** (0.0124)
Constant	2.622*** (0.000214)	2.527*** (2.07e-05)	3.344*** (7.34e-07)	1.190 (0.304)	2.453*** (0.000773)	1.648** (0.0245)	2.600*** (0.000509)	1.094 (0.360)
Observations	38	38	36	36	38	38	36	36
R-squared	0.157	0.339	0.400	0.501	0.136	0.411	0.412	0.503
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job justformoney	0.150 (0.106)	0.140 (0.136)	0.0521 (0.600)	-0.0139 (0.919)				
job evenwithoutmoney					0.505*** (1.96e-07)	0.476*** (6.45e-07)	0.409*** (5.09e-07)	0.360*** (2.18e-05)
Europe		-0.157** (0.0121)	-0.00801 (0.944)	-0.0226 (0.857)		-0.0514 (0.124)	0.0486 (0.286)	0.0298 (0.551)
Implicit tax			-0.0791 (0.119)	-0.0661 (0.245)			-0.0575*** (0.00365)	-0.0510** (0.0110)
Real GDP per capita				0.0229 (0.861)				0.0130 (0.826)
Standard retirement age				0.0443*** (0.00133)				0.0169 (0.246)
Constant	3.604*** (0)	3.772*** (0)	4.196*** (0)	1.290 (0.233)	2.401*** (1.91e-10)	2.541*** (7.24e-11)	2.872*** (0)	1.805*** (0.0268)
Observations	38	38	36	36	38	38	36	36
R-squared	0.081	0.212	0.354	0.499	0.590	0.602	0.689	0.707

OLS regressions with time fixed effects  
Included countries are those surveyed in ISSP 1989, 1997 or 2005  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable : Labor market participation rate of males aged between 55 and 64								
Implicit tax variable : Implicit tax on continued work for age group 60-64, including early retirement route								
rel management	0.391** (0.0234)	0.458*** (0.00160)	0.308** (0.0299)	0.156 (0.446)				
rel workmates					0.397* (0.0639)	0.639*** (0.000706)	0.496*** (0.00945)	0.319 (0.151)
Europe		-0.187*** (0.00145)	-0.108 (0.202)	-0.101 (0.194)		-0.243*** (0.000212)	-0.181* (0.0606)	-0.153* (0.0900)
Implicit tax			-0.0719* (0.0888)	-0.0631 (0.117)			-0.0454 (0.295)	-0.0440 (0.297)
Real GDP per capita				0.00737 (0.945)				-0.0119 (0.888)
Standard retirement age				0.0345* (0.0779)				0.0316* (0.888)
Constant	2.622*** (0.000214)	2.527*** (2.07e-05)	3.271*** (8.07e-07)	1.510 (0.245)	2.453*** (0.00773)	1.648** (0.0245)	2.346*** (0.00410)	1.130 (0.0568)
Observations	38	38	38	38	38	38	38	38
R-squared	0.157	0.339	0.400	0.460	0.136	0.411	0.430	0.479
job justformoney	0.150 (0.106)	0.140 (0.136)	0.00776 (0.942)	-0.0350 (0.771)				
job evenwithoutmoney					0.505*** (1.96e-07)	0.476*** (6.45e-07)	0.432*** (4.04e-07)	0.406*** (1.57e-05)
Europe		-0.157** (0.0121)	-0.0587 (0.453)	-0.0740 (0.322)		-0.0514 (0.124)	0.0106 (0.764)	0.000756 (0.984)
Implicit tax			-0.105** (0.0278)	-0.0812 (0.101)			-0.0742*** (0.00214)	-0.0688*** (0.00847)
Real GDP per capita				-0.000543 (0.996)				-0.0145 (0.819)
Standard retirement age				0.0429*** (0.00336)				0.0105 (0.507)
Constant	3.604*** (0)	3.772*** (0)	4.485*** (0)	1.793 (0.131)	2.401*** (1.91e-10)	2.541*** (7.24e-11)	2.887*** (0)	2.436*** (0.00910)
Observations	38	38	38	38	38	38	38	38
R-squared	0.081	0.212	0.340	0.450	0.590	0.602	0.683	0.688

OLS regressions with time fixed effects  
Included countries are those surveyed in ISSP 1989, 1997 or 2005  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3.1 - Panel data : Interactions with average working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 60-64						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	0.197*** (0.00440)	0.150* (0.0546)	0.118 (0.110)	0.345*** (4.33e-07)	0.255*** (0.000383)	0.245*** (0.000334)
Interaction	-0.0602*** (0.000843)	-0.0486** (0.0138)	-0.0413** (0.0285)	-0.0921*** (1.07e-07)	-0.0707*** (4.11e-05)	-0.0690*** (2.91e-05)
Unemployment rate	-0.0113*** (0)	-0.00658*** (0.000234)	-0.00713*** (0.000801)	-0.0108*** (0)	-0.00615*** (0.000599)	-0.00630*** (0.00279)
Real GDP per capita	-0.138*** (3.87e-07)	-0.0129 (0.825)	-0.0614 (0.352)	-0.132*** (3.65e-07)	-0.00567 (0.916)	-0.0415 (0.494)
Standard retirement age			-0.00830 (0.413)			-0.00848 (0.378)
Constant	5.671*** (0)	4.456*** (0)	5.474*** (3.75e-08)	5.623*** (0)	4.391*** (0)	5.291*** (9.29e-09)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	300	300	289	300	300	289
R-squared (within)	0.255	0.512	0.518	0.290	0.531	0.539
Number of countries	19	19	19	19	19	19
Min effect	-0,01	-0,02	-0,14	-0,01	-0,02	-0,02
Max effect	-0,06	-0,06	-0,18	-0,08	-0,07	-0,07
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	0.111*** (0.00118)	0.0252 (0.412)	0.0497 (0.198)	0.0316 (0.622)	0.114** (0.0499)	0.113** (0.0391)
Interaction	-0.0434*** (0.000174)	-0.0177* (0.0654)	-0.0269** (0.0159)	-0.0176 (0.318)	-0.0427*** (0.00581)	-0.0447*** (0.00289)
Unemployment rate	-0.0100*** (1.01e-09)	-0.00594*** (0.00196)	-0.00564** (0.0166)	-0.0108*** (1.07e-10)	-0.00514*** (0.00875)	-0.00589*** (0.00739)
Real GDP per capita	-0.141*** (4.90e-07)	-0.00880 (0.882)	-0.0427 (0.538)	-0.144*** (3.64e-07)	-0.0315 (0.598)	-0.0928 (0.158)
Standard retirement age			-0.0130 (0.199)			-0.00898 (0.353)
Constant	5.693*** (0)	4.407*** (0)	5.583*** (1.87e-08)	5.710*** (0)	4.615*** (0)	5.811*** (4.15e-09)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	300	300	289	300	300	289
R-squared (within)	0.261	0.501	0.516	0.234	0.520	0.529
Number of countries	19	19	19	19	19	19
Min effect	0,01	-0,04	-0,07	-	0	-0,01
Max effect	-0,06	-0,07	-0,11	-	-0,06	-0,07

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3.2 - Panel data : Interactions with average working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 55-59, including early retirement route						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	0.255*** (0.000305)	0.168** (0.0238)	0.185** (0.0103)	0.197*** (0.00556)	0.135* (0.0652)	0.154** (0.0270)
Interaction	-0.0797*** (3.95e-06)	-0.0530*** (0.00421)	-0.0569*** (0.00154)	-0.0578*** (0.000168)	-0.0397** (0.0139)	-0.0437*** (0.00438)
Unemployment rate	-0.0119*** (0)	-0.00718*** (0.00132)	-0.00702*** (0.00114)	-0.0114*** (0)	-0.00648*** (0.00427)	-0.00626*** (0.00390)
Real GDP per capita	-0.186*** (0)	-0.0664 (0.308)	-0.0504 (0.404)	-0.184*** (0)	-0.0574 (0.378)	-0.0398 (0.503)
Standard retirement age			0.00678 (0.544)			0.00696 (0.537)
Constant	6.201*** (0)	4.986*** (0)	4.389*** (9.57e-06)	6.171*** (0)	4.885*** (0)	4.260*** (1.80e-05)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	306	306	306	306	306	306
R-squared (within)	0.348	0.519	0.523	0.333	0.515	0.518
Number of countries	19	19	19	19	19	19
Min effect	-0,02	-0,01	-0,01	-0,03	-0,02	-0,02
Max effect	-0,09	-0,06	-0,06	-0,07	-0,05	-0,05
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	0.0187 (0.653)	-0.00345 (0.928)	0.00105 (0.976)	-0.00931 (0.882)	0.0390 (0.490)	0.0488 (0.400)
Interaction	-0.0182* (0.0715)	-0.00745 (0.412)	-0.00838 (0.321)	-0.0102 (0.517)	-0.0200 (0.134)	-0.0224 (0.100)
Unemployment rate	-0.0114*** (0)	-0.00650*** (0.00617)	-0.00635*** (0.00508)	-0.0115*** (0)	-0.00672*** (0.00303)	-0.00655*** (0.00286)
Real GDP per capita	-0.189*** (0)	-0.0673 (0.329)	-0.0567 (0.372)	-0.192*** (0)	-0.0917 (0.154)	-0.0803 (0.189)
Standard retirement age			0.00421 (0.725)			0.00587 (0.609)
Constant	6.214*** (0)	4.977*** (0)	4.598*** (1.17e-05)	6.253*** (0)	5.217*** (0)	4.723*** (4.14e-06)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	306	306	306	306	306	306
R-squared (within)	0.302	0.499	0.501	0.298	0.506	0.509
Number of countries	19	19	19	19	19	19
Min effect	-0,04	-	-	-	-	-
Max effect	-0,07	-	-	-	-	-

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3.3 - Panel data : Interactions with average working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 60-64, including early retirement route						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	0.140** (0.0268)	0.0738 (0.298)	0.0507 (0.436)	0.167*** (0.00447)	0.0943 (0.131)	0.0861 (0.152)
Interaction	-0.0459*** (0.00309)	-0.0272 (0.127)	-0.0216 (0.192)	-0.0485*** (0.000277)	-0.0299** (0.0387)	-0.0280** (0.0419)
Unemployment rate	-0.0109*** (0)	-0.00617*** (0.000518)	-0.00668*** (0.00152)	-0.0107*** (0)	-0.00595*** (0.000987)	-0.00624*** (0.00340)
Real GDP per capita	-0.142*** (1.92e-08)	-0.0109 (0.856)	-0.0510 (0.443)	-0.141*** (1.30e-08)	-0.00678 (0.909)	-0.0394 (0.551)
Standard retirement age			-0.00578 (0.555)			-0.00536 (0.576)
Constant	5.738*** (0)	4.444*** (0)	5.211*** (4.79e-08)	5.731*** (0)	4.402*** (0)	5.065*** (6.67e-08)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	317	317	306	317	317	306
Number of countries	19	19	19	19	19	19
R-squared (within)	0.284	0.500	0.503	0.291	0.503	0.507
Min effect	-0,02	-	-	-0,02	-0,12	-0,11
Max effect	-0,06	-	-	-0,05	-0,14	-0,13
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	0.0293 (0.416)	-0.00972 (0.742)	-0.00462 (0.908)	-0.0380 (0.517)	0.0387 (0.431)	0.0297 (0.521)
Interaction	-0.0191** (0.0498)	-0.00604 (0.454)	-0.00801 (0.428)	0.000903 (0.953)	-0.0197 (0.123)	-0.0177 (0.145)
Unemployment rate	-0.0107*** (0)	-0.00589*** (0.00128)	-0.00625*** (0.00545)	-0.0109*** (0)	-0.00571*** (0.00198)	-0.00639*** (0.00268)
Real GDP per capita	-0.146*** (1.49e-08)	-0.00751 (0.903)	-0.0444 (0.527)	-0.145*** (5.90e-08)	-0.0164 (0.787)	-0.0605 (0.362)
Standard retirement age			-0.00776 (0.427)			-0.00597 (0.537)
Constant	5.772*** (0)	4.408*** (0)	5.270*** (7.70e-08)	5.767*** (0)	4.487*** (0)	5.310*** (2.15e-08)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	317	317	306	317	317	306
Number of countries	19	19	19	19	19	19
R-squared (within)	0.272	0.493	0.500	0.264	0.500	0.504
Min effect	-0,05	-	-	-	-	-
Max effect	-0,07	-	-	-	-	-

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4.1 - Panel data : Interactions with the dispersion of working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 55-59						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	-0.0743*** (0.000428)	-0.0783*** (6.08e-06)	-0.0789*** (1.83e-05)	-0.0685*** (0.000169)	-0.0594*** (0.000497)	-0.0589*** (0.00119)
Interaction	0.243*** (0.000200)	0.269*** (1.30e-05)	0.301*** (6.18e-06)	0.346*** (7.75e-06)	0.290*** (0.000337)	0.329*** (0.000263)
Unemployment rate	-0.00925*** (0)	-0.00468** (0.0462)	-0.00404* (0.0732)	-0.00868*** (2.14e-10)	-0.00505** (0.0347)	-0.00448* (0.0516)
Real GDP per capita	-0.138*** (5.53e-08)	-0.0567 (0.483)	-0.0106 (0.897)	-0.140*** (2.90e-08)	-0.0852 (0.279)	-0.0459 (0.562)
Standard retirement age			0.0106 (0.323)			0.00952 (0.377)
Constant	5.637*** (0)	4.853*** (1.16e-08)	3.704*** (0.00338)	5.656*** (0)	5.135*** (7.28e-10)	4.124*** (0.000791)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	288	288	288	288	288	288
Number of countries	18	18	18	18	18	18
R-squared (within)	0.237	0.502	0.510	0.247	0.486	0.493
Min effect	-0.05	-0.05	-0.05	-0.04	-0.04	-0.03
Max effect	0	0	0,01	0	0	0,01
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	-0.0206 (0.506)	0.0150 (0.620)	0.0204 (0.507)	-0.0247 (0.209)	-0.0303 (0.140)	-0.0288 (0.163)
Interaction	0.00308 (0.930)	-0.0643** (0.0319)	-0.0695** (0.0195)	0.0118 (0.604)	0.0262 (0.173)	0.0252 (0.217)
Unemployment rate	-0.00954*** (1.00e-09)	-0.00732*** (0.00210)	-0.00722*** (0.00214)	-0.00947*** (1.25e-10)	-0.00606** (0.0115)	-0.00600** (0.0109)
Real GDP per capita	-0.153*** (7.40e-09)	-0.141* (0.0643)	-0.127* (0.0988)	-0.154*** (5.28e-09)	-0.128 (0.115)	-0.122 (0.127)
Standard retirement age			0.00435 (0.710)			0.00161 (0.891)
Constant	5.787*** (0)	5.678*** (0)	5.253*** (2.66e-05)	5.794*** (0)	5.557*** (1.57e-10)	5.393*** (1.97e-05)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	288	288	288	288	288	288
Number of countries	18	18	18	18	18	18
R-squared (within)	0.192	0.458	0.459	0.192	0.453	0.453
Min effect	-	-0,02	-0,02	-	-	-
Max effect	-	-0,05	-0,05	-	-	-

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4.2 - Panel data : Interactions with the dispersion of working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 55-59, including early retirement route						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	-0.0780*** (2.51e-06)	-0.0616*** (6.10e-05)	-0.0628*** (0.000152)	-0.0704*** (8.33e-07)	-0.0520*** (7.91e-05)	-0.0530*** (0.000251)
Interaction	0.159*** (0.00863)	0.147** (0.0134)	0.163*** (0.00540)	0.217*** (0.00684)	0.182** (0.0213)	0.211*** (0.00742)
Unemployment rate	-0.0112*** (0)	-0.00548** (0.0184)	-0.00512** (0.0178)	-0.0108*** (0)	-0.00537** (0.0236)	-0.00491** (0.0256)
Real GDP per capita	-0.175*** (0)	-0.0185 (0.798)	0.00585 (0.928)	-0.177*** (0)	-0.0353 (0.610)	-0.00973 (0.876)
Standard retirement age			0.00786 (0.483)			0.00839 (0.449)
Constant	6.079*** (0)	4.502*** (2.39e-09)	3.751*** (0.000210)	6.094*** (0)	4.661*** (1.45e-10)	3.864*** (0.000115)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	306	306	306	306	306	306
R-squared (within)	0.323	0.519	0.524	0.322	0.515	0.521
Number of countries	19	19	19	19	19	19
Min effect	-0,06	-0,05	-0,04	-0,05	-0,04	-0,04
Max effect	-0,03	-0,02	-0,01	-0,03	-0,01	-0,01
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	-0.0375* (0.0732)	-0.0135 (0.509)	-0.0122 (0.549)	-0.0432*** (0.00224)	-0.0346*** (0.00937)	-0.0335** (0.0128)
Interaction	-0.0124 (0.593)	-0.0316 (0.221)	-0.0317 (0.212)	-0.000150 (0.994)	0.0159 (0.446)	0.0164 (0.428)
Unemployment rate	-0.0116*** (0)	-0.00711*** (0.00180)	-0.00700*** (0.00147)	-0.0116*** (0)	-0.00667*** (0.00338)	-0.00655*** (0.00285)
Real GDP per capita	-0.188*** (0)	-0.0850 (0.184)	-0.0762 (0.204)	-0.189*** (0)	-0.0778 (0.237)	-0.0688 (0.268)
Standard retirement age			0.00392 (0.744)			0.00403 (0.734)
Constant	6.214*** (0)	5.157*** (0)	4.816*** (3,47e-06)	6.225*** (0)	5.081*** (0)	4.731*** (5.91e-06)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	306	306	306	306	306	306
R-squared (within)	0.297	0.501	0.502	0.296	0.500	0.501
Number of countries	19	19	19	19	19	19
Min effect	-	-	-	-	-	-
Max effect	-	-	-	-	-	-

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4.3 - Panel data : Interactions with the dispersion of working conditions						
Dependent variable : Labor market participation rate of males aged between 55 and 64						
Implicit tax variable : Implicit tax on continued work for age group 60-64, including early retirement route						
	(1)	(2)	(3)	(4)	(5)	(6)
	rel management			rel workmates		
Implicit tax	-0.0605*** (0.000227)	-0.0550*** (2.42e-05)	-0.0538*** (0.000855)	-0.0680*** (9.13e-06)	-0.0564*** (1.32e-05)	-0.0545*** (9.70e-05)
Interaction	0.110** (0.0342)	0.108** (0.0389)	0.0932* (0.0682)	0.251*** (0.000222)	0.199*** (0.00512)	0.187*** (0.00480)
Unemployment rate	-0.0106*** (0)	-0.00520*** (0.00605)	-0.00577*** (0.00729)	-0.00982*** (0)	-0.00476*** (0.00915)	-0.00489** (0.0195)
Real GDP per capita	-0.134*** (1.44e-07)	0.0243 (0.713)	-0.0148 (0.836)	-0.130*** (1.24e-07)	0.0216 (0.725)	-0.00263 (0.969)
Standard retirement age			-0.00454 (0.643)			-0.00320 (0.727)
Constant	5.661*** (0)	4.102*** (1.44e-09)	4.781*** (1.75e-06)	5.619*** (0)	4.123*** (5.96e-11)	4.560*** (8.91e-07)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	317	317	306	317	317	306
Number of countries	19	19	19	19	19	19
R-squared (within)	0.279	0.506	0.507	0.303	0.516	0.518
Min effect	-0,05	-0,04	-0,04	-0,05	-0,04	-0,04
Max effect	-0,03	-0,02	-0,03	-0,02	-0,02	-0,02
	(7)	(8)	(9)	(10)	(11)	(12)
	job justformoney			job evenwithoutmoney		
Implicit tax	-0.0337** (0.0300)	-0.0309** (0.0326)	-0.0357** (0.0200)	-0.0333** (0.0120)	-0.0368*** (0.000549)	-0.0406*** (0.00184)
Interaction	-0.00300 (0.894)	0.00251 (0.925)	0.00846 (0.765)	-0.00464 (0.758)	0.0203 (0.241)	0.0235 (0.205)
Unemployment rate	-0.0109*** (0)	-0.00599*** (0.000940)	-0.00647*** (0.00272)	-0.0109*** (0)	-0.00582*** (0.00115)	-0.00639*** (0.00239)
Real GDP per capita	-0.145*** (2.42e-08)	-0.0117 (0.848)	-0.0535 (0.426)	-0.145*** (3.46e-08)	-0.0107 (0.862)	-0.0559 (0.414)
Standard retirement age			-0.00813 (0.409)			-0.00863 (0.371)
Constant	5.767*** (0)	4.450*** (0)	5.386*** (1.42e-08)	5.765*** (0)	4.436*** (0)	5.439*** (1.44e-08)
Time fixed effects	-	Yes	Yes	-	Yes	Yes
Observations	317	317	306	317	317	306
Number of countries	19	19	19	19	19	19
R-squared (within)	0.264	0.493	0.499	0.264	0.496	0.503
Min effect	-	-	-	-	-	-
Max effect	-	-	-	-	-	-

OLS regressions with country fixed effects  
Robust p values in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1